

Integrated Receivers for NASA Radiometers, Phase I

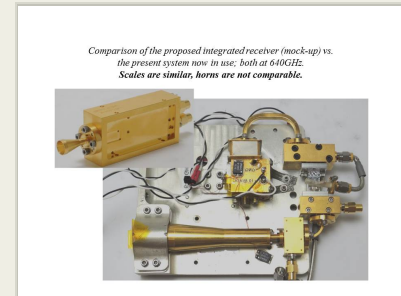
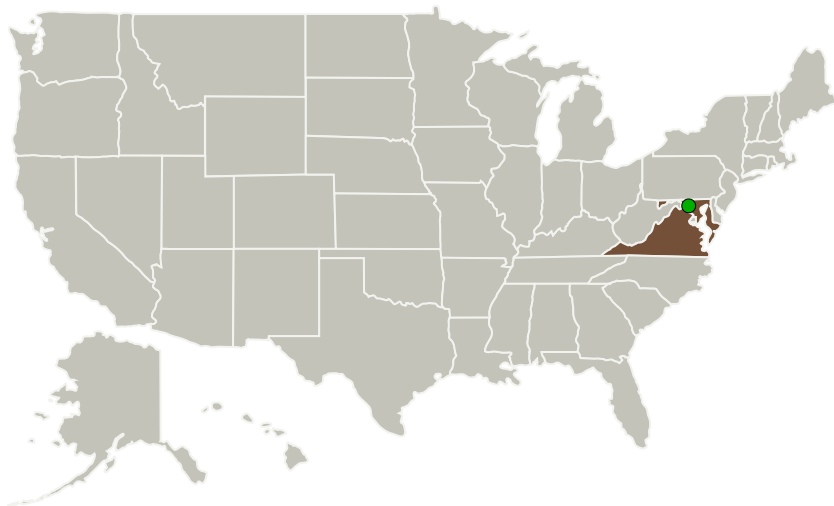
Completed Technology Project (2014 - 2014)



Project Introduction

This proposal is responsive to NASA SBIR Subtopic S1.02: Microwave Technologies for Remote Sensing, 640GHz Polarimeter. VDI has recently demonstrated the integration of a WR10 Mixer-Amplifier Multiplier chain (MixAMC), including the LO and IF amplifier MMICs, into a single waveguide housing. The focus of the proposed research is the extension these innovative integration technologies to include additional components required for atmospheric radiometers, and to extend the resulting technology across the frequency band of interest to NASA. Such integration will fundamentally improve the size, weight, reliability and cost of terahertz receivers. Additionally, the integration of a newly available low noise MMIC amplifier at the front-end of the receiver will allow these improvements to be achieved with an overall reduction in the power requirements and an increase in receiver sensitivity. At the end of the Phase 2 VDI will deliver to NASA a very compact and reliable receiver system suitable for polarimetric measurements at 640GHz. The ultimate result of this SBIR program will be the commercial availability of compact, reliable and cost effective receiver systems throughout the frequency range of interest for atmospheric remote sensing, including polarimetric measurement capabilities. Additionally, the new compact receivers will be compatible with CubeSats, which are expected to play a very important role in future atmospheric remote sensing missions.

Primary U.S. Work Locations and Key Partners



Integrated Receivers for NASA Radiometers Project Image

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Organizations Performing Work	Role	Type	Location
Virginia Diodes, Inc.	Lead Organization	Industry	Charlottesville, Virginia
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

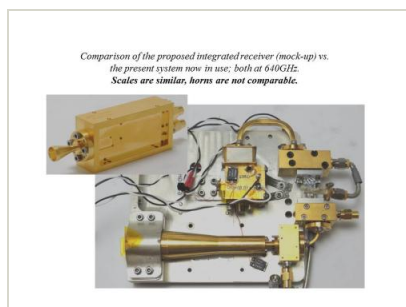
▶ **June 2014:** Project Start

✓ **December 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137687>)

Images



Project Image

Integrated Receivers for NASA Radiometers Project Image (<https://techport.nasa.gov/image/130923>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Virginia Diodes, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

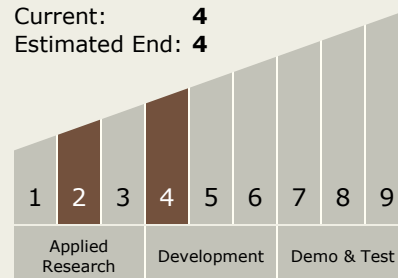
Carlos Torrez

Principal Investigator:

Jeffrey L Hesler

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System